Wednesday, March 21, 1990
8:30AM–10:00AM, Room 43
Coronary Angioplasty/Thrombolysis

ASSESSMENT OF INTRACORONARY FIBRIN METABOLISM AFTER CORONARY ANGIOPLASTY IN MAN.

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Assessment of intracoronary (IC) thrombus during coronary angioplasty (CA) in man has been primarily limited to angiographic analysis which can detect only large IC thrombi. To determine if there is biochemical evidence of increased IC fibrin metabolism following CA, translesion blood samples were collected (proximal and distal to the IC dilatation site) via the CA balloon catheter for assay of cross-linked fibrin degradation products (XDP), immediately before and following CA in 32 pts. XDP are formed from lysis of fibrin polymer. Validation studies demonstrated that sampling via the CA catheter could be performed for at least 20 min without artifactual elevation of XDP. All CA pts received aspirin, dipyridamole and IV heparin to prolong the activated clotting time >300 sec. Prior to CA, there was no translesion difference in XDP levels. After CA, there was a 36 ± 13 ng/ml (mean ± SEM) translesion increase ($p<0.01$ by paired t-test) in XDP levels (proximal 408 ± 37 ng/ml; distal 444 ± 44 ng/ml). The highest individual translesion XDP increase (256 ng/ml) occurred in a pt who had abrupt closure 20 min after CA. These data indicate that fibrin degradation can be detected immediately after CA despite aggressive pretreatment with antiplatelet and anticoagulation drugs. This finding may have implications in the pathophysiology of adverse events following CA.

THE ROLE OF INTRACORONARY UROKINASE IN COMBINATION WITH CORONARY ANGIOPLASTY IN PATIENTS WITH COMPLEX LESION MORPHOLOGY.

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Patients (pts) with complex lesion morphology [intracoronary (IC) thrombus, ulcerated lesions] are at higher risk of complications during coronary angioplasty (PTCA). However, the role of combined IC thrombolysis and PTCA in such pts has not been characterized. IC urokinase (UK) was employed during PTCA in 23 pts from 4/88 to 5/89. There were 13 men and 10 women, mean age 56 yrs; 9 pts (39%) had rest angina, 8 pts (35%) post MI angina, 6 pts (26%) had recent MI (<15 days); 5 pts (22%) had prior bypass surgery (CABG). Vessels dilated were: LAD 7 pts, RCA 10 pts, LCX 2 pts, vein grafts 4 pts. Pre-PTCA angiography showed thrombotic occlusion in 11 vessels (including 4 grafts) (48%), ulcerated lesions in 7 (30%), IC filling defects in 5 (22%). Indications for ICUK were: extensive IC thrombus in 12 pts, distal embolization in 7, abrupt closure in 4. Pts received ICUK 345,000 ± 113,000 I.U. (range 250,000 - 500,000). Angiographic success was achieved in 22/23 pts (96%), all with TIMI 3 flow; 1 pt had urgent CABG; 4 pts (17%) had persistent distal embolization with small non-Q wave MI. Fibrinogen levels were 373±77 mg/dl pre and 375±72 post ICUK, p=NS; there were no bleeding complications.

Thus, ICUK may be an effective adjuvant to PTCA in pts with high risk features and may enhance success rate in thrombotic occlusions and totally occluded grafts. ICUK appears to be safe, without systemic lytic effects at the dosage employed in this study.

THREE DAYS OF HEPARIN PRETREATMENT REDUCES MAJOR COMPLICATIONS OF CORONARY ANGIOPLASTY IN PATIENTS WITH UNSTABLE ANGINA

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The incidence of major complications of coronary angioplasty (PTCA) is higher in patients with unstable angina compared to stable angina. We studied the effect of continuous intravenous (IV) heparin given prior to PTCA on major PTCA-related complications in one hundred eighty-eight patients with unstable angina to determine if complications could be reduced. Sixty-two unstable patients received continuous therapeutic IV heparin for at least 3 days prior to PTCA (pre-heparin). One hundred twenty-six unstable patients did not receive prior treatment with IV heparin (no pre-heparin). Both groups had PTCA using standard protocols which included usual doses of heparin (intraprocedural), aspirin, calcium channel blockers and nitrates. Age, sex, LV ejection fraction, LVEDP, number of diseased vessels and incidence of total occlusions did not differ between the two groups. There were more left anterior descending PTCAs in the no pre-heparin group ($p=0.024$), however, the vessel dilated was not significantly associated with major complications. Data were analyzed by chi square or Fisher's exact test (with two-tailed p values) where appropriate. Results are shown below. PTCA was considered a failure when the residual stenosis was greater than 50%.

Complication	No Pre-Heparin	Pre-Heparin	p
Acute vessel closure	13/126	1/62	0.038
Emergency bypass surgery	16/126	0/62	0.002
Failed PTCA	28/126	3/62	0.002
Acute myocardial infarction	5/126	0/62	0.173
Death	3/126	0/62	0.552

These observational data suggest that three days of continuous IV heparin prior to PTCA in unstable patients significantly reduces the incidence of major complications.

RAPID THROMBUS DISSOLUTION BY CONTINUOUS INFUSION OF UROKINASE THROUGH AN INTRACORONARY PERFUSION WIRE PRIOR TO PTCA: RESULTS IN NATIVE CORONARIES AND PATENT SAPHENOUS VEIN GRAFTS.

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Unstable angina and post infarction patients who have received intravenous thrombolytic therapy often present at diagnostic angiography with thrombus associated with a fixed stenosis despite aspirin and heparin. PTCA in this setting results in increased complication rates and prolonged heparin infusion has yielded mixed results in decreasing thrombus burden. Prolonged intra-arterial Urokinase (UK) infusion has been used in occluded Saphenous Vein Grafts (SVG) but has not been previously reported in native coronaries or patent SVG. We report on 10 patients who received 24 hours of intracoronary UK through a perfusion wire placed at the site of angiographic thrombus prior to PTCA. Therapy consisted of UK 100-120,00 U intracoronary bolus, followed by UK infusion of 80-100,000 U/hour times 24 hours, followed by PTCA. Vessels treated were 5 native RCA and 5 patent SVG. Complete thrombus resolution was seen in 8 to 10 vessels and successful PTCA without distal embolization, accomplished in all. No significant bleeding complications were observed.

In conclusion, rapid lysis of intracoronary thrombus can be accomplished safely using this technique and can result in improved PTCA outcome.